be returned safely to the abdomen, and to the occasional small scirrhous carcinoma easily brought outside the abdomen. I feel we are much indebted to Doctor Gehrels for his timely and very comprehensive contribution on this method.

I agree that when cancer of the transverse or descending colon is found, whether totally or partially obstructing, an immediate resection is rarely indicated. In nearly all of my recent resections of any portion of the transverse or descending colon, I have first done a cecostomy. This not only prepares the patient by permitting the acute symptoms to subside, but acts as a vent for gases, preventing distention and a possible blow-out at the suture line after resection. A cecostomy also has the advantage of being well to the right, leaving a clean uncontaminated left abdominal field for a safe radical resection in usually about ten days.

In opening an abdomen for suspected cancer beyond the ascending colon, a left outer rectus incision will permit inspection and exploration to determine the location and involvement. If it is a case for resection and the involved portion can safely be replaced in the abdomen, my usual practice is to decide against a Mikulicz. I then insert my hand over to the right lower abdomen and determine where a knuckle of cecum can best be made protrude through an incision farthest to the right above the ileac crest. The incision through the abdominal wall is no longer than the knuckle of cecum requires for an ample protrusion and opening. Absorbable sutures placed in the outer coats of the cecum, peritoneum and fascia, secure the knuckle. No sutures are placed in the skin and there is no later infection. If the distention is acute and symptoms urgent, a drainage tube can be at once purse-stringed into the cecum as soon as the left rectus incision has been closed and protected by vaselin gauze. The left abdominal wall can be thus left free from contamination for the later resection. Through a large drainage tube in the cecum the colon is gradually washed out with saline and there is no contamination of the cecostomy dressing for three or four days. When the tube loosens, an ample opening is made and drains the entire colon quite satisfactorily with irrigation. This cecostomy opening, in my experience, either closes of its own accord or can be closed with a few stitches when it is no longer required, without entering the abdomen.

Doctor Gehrels states one of the main objections to the Mikulicz operation in cancer has been that it might not be radical enough—that involved glands in the mesentery may not be removed. It has been my experience that, as the operation is usually performed, this is true and I think a more open procedure is indicated in cancer cases, if, when the abdomen is first opened, it is found the involved section of bowel can be temporarily replaced.

In a resection the all-important points are: removal of involved glands, prevention of impaired circulation at the suture line to avoid a blow-out from necrosis and provision to prevent distention.

After resection, I usually do an end-to-end anastomosis by my aseptic technique published in the *Annals of Surgery*, December 1922; but safeguard this suture line from a blow-out by invaginating it into the gut below for an inch or so, suturing the gut wall from below up over the suture line. A tube is inserted through the anal canal, and, guided by the hand in the abdomen, passed up beyond the anastomosis several inches. With both tube and the cecostomy functioning there is no dangerous distention and rarely even a temporary fecal fistula at the point of resection. No drainage is employed. The average hospital stay is from three to four weeks from the time the patient first entered.

❦

Doctor Gehrels (Closing).—We all agree on one point, that a one-stage operation on the left side of the colon is rarely advisable. The choice rests between a Mikulicz operation and a three-stage operation as Doctor Collins outlined. To compare the advantages of these two methods has been the object of this paper. In order to do colon surgery most successfully, a familiarity with both methods and their advantages is necessary. The choice of method will have to be determined by the anatomical findings in each individual case. For the majority of cases, I have found the Mikulicz operation most satisfactory when done in the way I have outlined.

It pleases me to hear that Doctor Coffey, with his great experience in colon surgery, is well satisfied with the Mikulicz procedure.

My experience with the crushing of the spur and the extraperitoneal closure of the resulting fecal fistula in the second stage of the Mikulicz operation has been less fortunate than Doctor Coffey's. This was the reason for ceasing to crush the spur, and for adopting the procedure which was described.

DIVERTICULA OF THE URINARY BLADDER IN WOMEN*

REPORT OF CASES

By Jay J. Crane, M. D.
Los Angeles

Discussion *by Herbert A. Rosenkranz, M. D., Los Angeles; George F. Schenck, M. D., Los Angeles; J. C. Negley, M. D., Los Angeles.*

In the United States only five cases of diverticula had been reported prior to 1906, and these were in men. Since the advent of our present-day cystoscopic and improved roentgen ray technique, diverticula have frequently been seen. There is scarcely a clinic that has not reported a large series of cases. These reports have been very complete and extensive. In fact, there has been so much written regarding diverticula that it is not necessary to dwell on the subject in detail. However, since diverticula in women are relatively rare, comprising about 5 per cent of all reported cases, the three cases here reported were thought to be of sufficient interest to merit mention.

In attempting to prove the etiology of diverticula much careful study has been done by urologists but their opinions are still divided. Thus some believe that all diverticula are congenital; many believe that they may be either congenital or acquired; while still others contend that they are always acquired. It is true that nearly all of the diverticula seen in men are associated with obstructive lesions at or below the bladder neck. This fact also holds true for women. The three cases of diverticula and one case of an incipient diverticulosis are here reported because of their unusual occurrence in women and because of the definite symptom complexes and pronounced pathological findings.

REPORT OF CASES

Case 1.—Mrs. E. M., Case 281731, Los Angeles General Hospital. Age 41.

Complaint.—Came for relief of: (1) difficulty in urinating; (2) pain over bladder region; (3) sand in urine; (4) hematuria.

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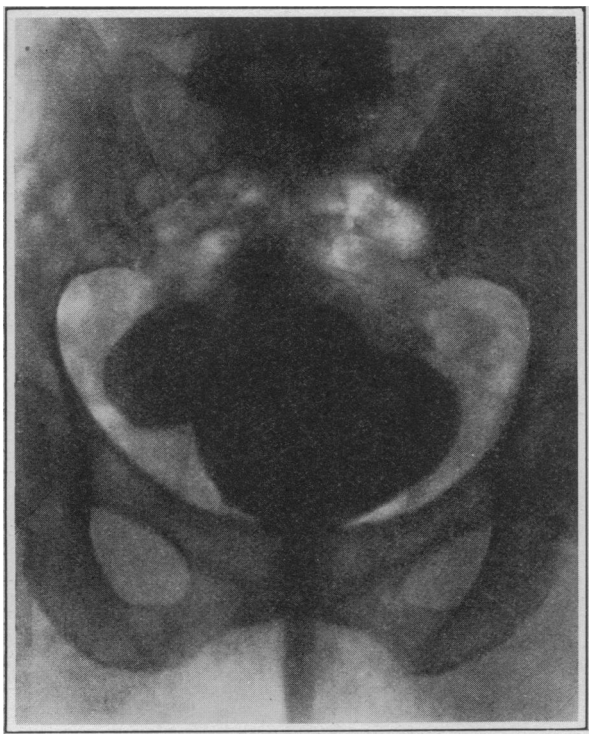
* Read before the Urology Section of the California Medical Association at the fifty-eighth annual session at Coronado, May 6-9, 1929.



Case 1.—Large multiple diverticula urinary bladder.

Examination.—Revealed an acute retention of urine due to a filiform stricture of the urethra. This was gradually dilated over a period of weeks until a cystoscope could be introduced into the bladder. A large diverticulum was found behind the right ureteral orifice and still another on the posterior bladder wall and another almost in the vault of the bladder. The largest diverticulum, which was situated behind the right ureteral orifice, did not drain freely. Some small particles of sand were washed out through the cystoscope.

Diagnosis.—Diverticula of the urinary bladder, due to strictures of urethra.

* * *

Case 2.—Mrs. I. F. W. Case 40166 Los Angeles General Hospital. Age 81.

Complaint.—(1) Extreme frequency; (2) intense dysuria especially at close of urination; (3) senility. Symptoms have been progressively growing worse for the past six months until at the present time the patient can scarcely control urine.

Examination.—Large cystocele and procidentia of uterus.

Cystoscopic Examination.—On entrance, 200 cubic centimeters of residual urine was found in the bladder. At the time of cystoscopic examination 30 cubic centimeters residual urine was found after patient had been in bed for a few days. Her symptoms also improved with bed rest. There was a small caruncle at external meatus of urethra and a marked cystocele. The bladder mucosa was acutely inflamed, only slight trabeculations being seen. Behind the right ureteral orifice on the wall of the bladder was the mouth of a large diverticulum which would hold approximately 75 cubic centimeters of fluid. This seemed to empty completely when the patient would lie down.

Diagnosis.—Diverticulum of the urinary bladder, due to procidentia of the uterus and cystocele.

* * *

Case 3.—Mrs. O. M. Case 39704, Los Angeles General Hospital. Age 38.

Complaint.—She was admitted to the hospital for relief of difficulty in urinating, fever, pain and swelling over lower part of abdomen.

Examination.—Revealed the absence of labia majora and external meatus urethra. Previous records disclosed that a few years previously the patient had had genital ulcers resembling tuberculosis and had had them cauterized with the actual cautery. A dimple in a mass of scar tissue was all that remained of the external urethral orifice.

Cystoscopic Examination.—Under spinal anesthesia a filiform was introduced. Later a small cystoscope was passed. A large, badly infected diverticulum was found on the left wall of the bladder. These findings were verified with a cystogram.

Diagnosis.—Diverticulum of the urinary bladder, due to stricture of urethra.

* * *

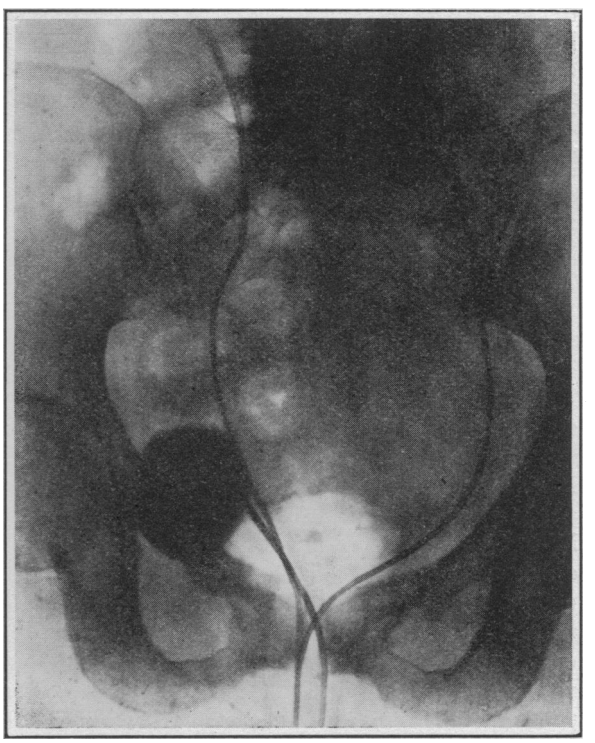
Case 4.—Mrs. B. Case 21902, Hollywood Hospital. Age 69.

Symptoms.—Came for the relief of frequent painful urination and of constant desire to urinate, which she had endured for several years. When she developed a severe hematuria she sought relief.

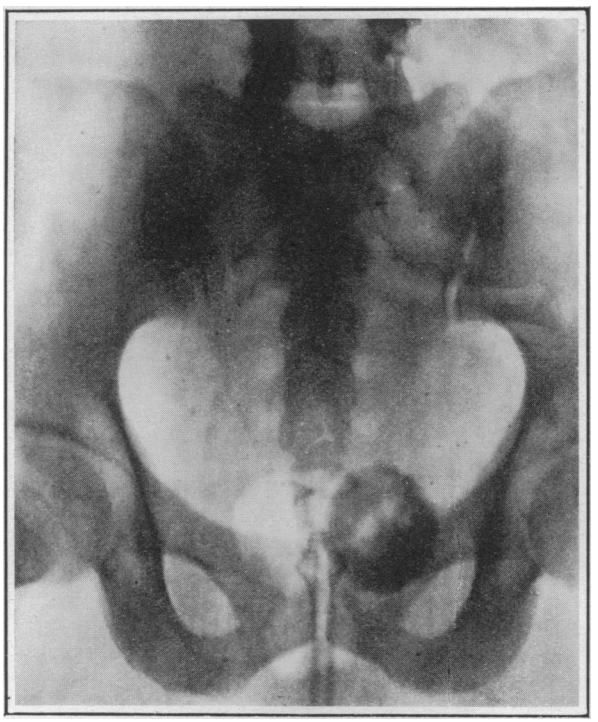
Examination.—Revealed: (1) A procidentia of the uterus to such an extent that the cervix was protruding out of the vagina; (2) marked cystocele.

Cystoscopic Examination.—Revealed a minimum of 20 cubic centimeters of residual urine. The uterus was reduced before the cystoscope could be passed successfully. Bladder urine was bloody and contained many small blood clots. The mucosa was intensely inflamed. Two small diverticula openings were immediately noted, one on the posterior bladder wall and the other almost in the vault of the bladder. Trabeculation was general and well developed and many large cellules were also present, some of which were almost full-fledged diverticula. The bleeding was from the intensely inflamed mucosa.

Diagnosis.—Incipient diverticulosis of the urinary bladder, due to procidentia of uterus and cystocele.



Case 2.—Large diverticulum filled with sodium iodid, and ureteral catheter in diverticulum bladder filled with air.



Case 3.—Bladder filled with air and large diverticulum filled with sodium iodid.

COMMENT

Symptoms.—There was no definite symptom complex which would indicate that a diverticulum was present. I believe that bladder tenesmus as demonstrated by severe, excruciating pain during and just following urination, is the most common symptom. Especially is this true when the diverticulum does not empty freely. Some emphasis has been put upon the inability of a patient to completely empty the bladder at one sitting, thus requiring two or more successive micturitions. Patients with diverticula whom I have examined and who have experienced this symptom complex have had obstructive lesions at the bladder neck and I could not ascertain whether the symptoms were due to the obstruction or diverticula. Most diverticula are symptomless until infection occurs due to poor drainage in the diverticulum itself or at the bladder neck. Poor drainage inevitably ends in infection, not only of the diverticulum, but of the bladder as well, which itself also produces symptoms. Thus the symptoms of a diverticulum are similar to those of an infected bladder or those of a bladder neck obstruction where a stone is present. "In short the subjective symptoms of a poorly draining infected diverticulum especially in the presence of ammoniacal urine are not exceeded by advanced vesicle tuberculosis, carcinoma, or stone."[1] One patient came for the relief of hematuria as a major symptom. Two came chiefly because of difficulty in urinating, and in the fourth case, a mild incontinence was the most distressing symptom. Thus there are no symptoms so constant and accurate that the diagnosis of a diverticulum can be made without the cystoscope and roentgen ray.

Diagnosis.—Most diverticula are found during the process of a routine urological examination. This was true in our four cases in women. We were searching for the cause of their symptoms when the orifices of the diverticula were seen with the cystoscope. Cystoscopic examination will usually reveal the presence of a diverticulum, but it alone cannot tell the whole story. An opaque catheter curled in a diverticulum, a cystogram, and a contrast cystogram taken in more than one plane will give an accurate idea of the size, exact location, number and whether they are in a position to drain freely or not.

Treatment.—The consensus of opinion is to relieve the obstruction whether in the urethra or at the bladder neck, before or at the time of doing the diverticulectomy. This is essential if reoccurrence of the condition is to be avoided. However, excision of the diverticulum is not always necessary after the obstruction is relieved if it drains well. Pousson sutures the orifice of the diverticulum without excision of the sac. Chute and Pousson also enlarge the orifice, especially in cases that will drain. Young, Hinman, Howard, Lomer and Squier do a radical excision of the diverticulum in toto, as do MacGowan, Day and Rosenkranz.

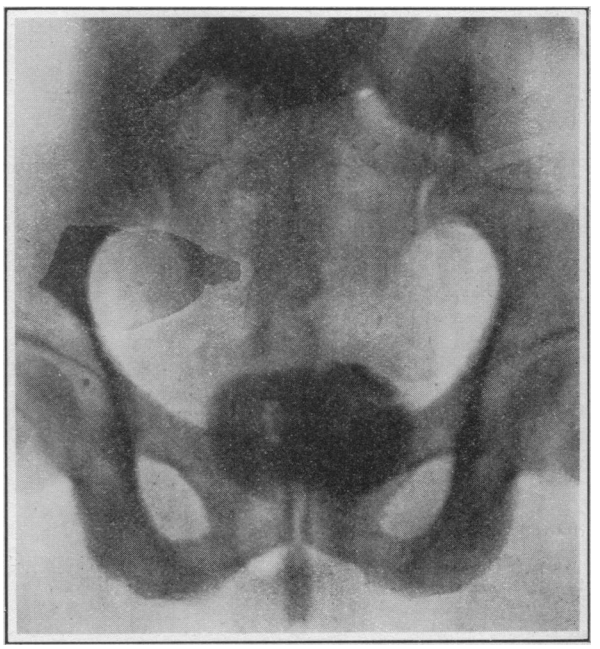
2007 Wilshire Boulevard.

REFERENCE

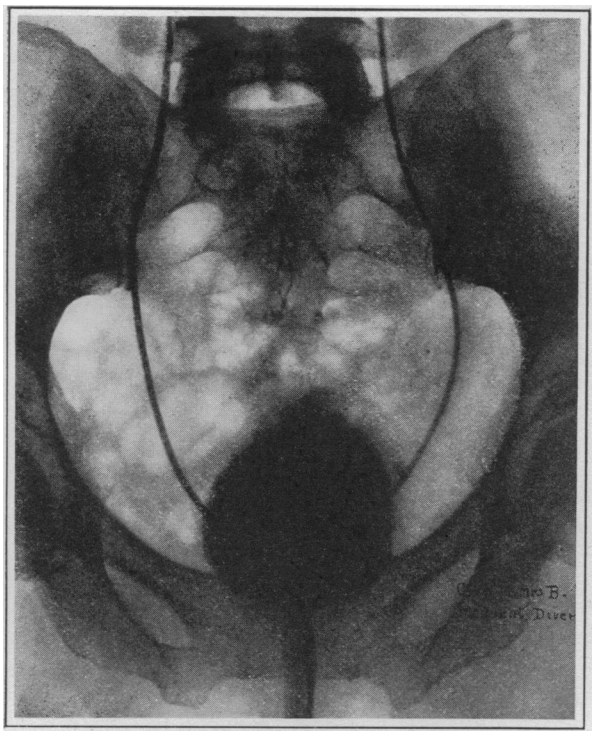
1. Day and Martin: Diverticulum of Urinary Bladder, J. A. M. A., January 24, 1925, Vol. 34.

DISCUSSION

HERBERT A. ROSENKRANZ, M. D. (1024 W. P. Story Building, Los Angeles).—This is an excellent presentation of a series of rare cases. Doctor Crane has, for the first time in medical literature, emphasized procidentia and cystocele as a cause of diverticulum. The more frequent cystoscopy of cases of stubborn "bladder trouble" will, of course, reveal an ever-increasing number of diverticula.



Case 3.—Bladder and diverticulum, both filled with sodium iodid.



Case 4.—Incipient diverticulosis, urinary bladder.

As Doctor Crane has noted, we have achieved cures by peeling out very large diverticula, some of them larger than the bladder itself. Those situated at the base of the bladder cannot drain and become filled with a foul jelly-like pus. These must be drained suprapubically by a large Pezzer catheter in the diverticulum itself to relieve the patient of his dangerously toxic condition prior to diverticulectomy. In some cases however that present no line of cleavage, I enlarge the orifice in a stellate direction and apply the Percy cautery contacting pretty thoroughly to the mucosa of the diverticulum twice rapidly at low heat. About two years ago at the General Hospital I first applied this method with the result that when Doctor Negley cystoscoped the case several months later the diverticulum had disappeared with hardly a trace. I usually drain the diverticulum cavity laterally to the bladder and suture the orifice of the diverticulum. Although diverticula have occasionally been resected deeply so that a thick walled viscus is removed I consider this a dangerous procedure in view of the danger of injury to the rectum, peritoneum, ureters, large vessels and other organs.

My experience urges me to emphasize the advantage of suturing the circularly incised bladder at the neck of the diverticulum to the skin at the beginning of the operation in order to facilitate peeling out the diverticulum. The sponge forceps is ideal for grasping the edges of the diverticulum and should be adopted in place of the Allis clamps still featured in the textbooks.

The surgery of this condition is going to become of ever-increasing importance when more diagnoses are made and when the life-shortening complications of this condition are more widely appreciated.

GEORGE F. SCHENCK, M. D. (511 Westlake Professional Building, Los Angeles).—Doctor Crane has presented an interesting series of cases that are sufficiently rare to warrant consideration. It is to be noted that two of his patients had strictures of the urethra, and two had marked cystoceles and procidentia. Urinary obstruction plus residual urine terminated in hypertrophy of the bladder musculature, and caused the appearance of trabeculations. The diverticula are just a step further in the destructive processes of obstruction in the lower urinary tract.

Frequency, dysuria, hematuria, pyuria, and incontinence were the cardinal symptoms in all of his cases, as they are in 90 per cent of all urological cases. To the urologist each one of them is a signpost recommending a urological study for the purpose of making a diagnosis. The early recognition and treatment of urinary obstruction in the upper and lower urinary tracts has amply demonstrated the merits of urological study. For some unaccountable reason, the same symptoms in female patients do not maintain the same significance to many physicians. A thorough urological study will reveal a definite cause for their urinary disturbances, and offer treatment that is not empirical.

Doctor Crane has pointed out to us that diverticula occur in women, and the symptoms are precisely the same as they are in male patients. The etiological factor in 50 per cent of his cases was stricture of the urethra, which, contrary to general opinion, is relatively common in women. The other 50 per cent were caused by procidentia, and cystocele; and both exist to some degree in every multipara.

J. C. NEGLEY, M. D. (Brack Shops Building, Los Angeles).—Doctor Crane has covered this subject in such a comprehensive manner that discussion is rendered difficult.

The problem of the treatment of diverticula in women is much less complicated than in men, because the latter have more anatomical or physiological reasons for developing diverticula. I agree with the writer that procidentia is a cause of diverticula, but with reluctance would accept cystocele alone as a cause of diverticula. If such were the case, surely more diverticula would have been reported in women.

Since these cases have marked tenesmus, severe, agonizing pain and marked reaction, following cystoscopy, the most gentle procedures should be adopted for their diagnosis. The procedure of coiling a rather stiff ureteral catheter in the diverticulum and allowing it to remain for all the subsequent moving about for x-rays, is unnecessary and pain-producing, and serves to lower the resistance of an already debilitated patient. Cystograms should not be repeated too many times, even if scientific knowledge is gained thereby. Only mild solutions, such as neosilvol, 15 per cent; argyrol, 20 per cent; campiodol, 12½ per cent; argo iodin, 2 per cent; and if sodium iodid is used, not over a 6 per cent solution is advisable.

Patients with diverticula are generally poor surgical risks and the more conservative methods for their relief are much to be preferred. Complicated and bizarre methods for resection of the diverticulum subject the patient to a long stay on the table, a protracted convalescence and in a large number of cases a lowering of bladder capacity to a marked degree.

Procedures for relief of obstruction, whether such be from urethral stricture or one of the many bladder neck or other conditions become primary in importance. Surgical procedures on the diverticulum are many and varied. Our preferences include the use of the cutting cautery on the most dependent margin surrounding the opening—a similar use of a Young's punch or the rongeur or resection of a wedge-shaped section, similar to the technique of trigonectomy for hypertrophied trigone. If any of the latter three are used, measures directed to the control of hemorrhage should be instituted including use of the Tolyson punch, or diathermy. If extensive resection is performed on a dependent margin of a diverticulum, interrupted sutures to control hemorrhage are always applied to the cut edges.